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SPECIFICATION FOR CASTOR OIL FOR COSMETIC INDUSTRY

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Indian Standard

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(*Continued on page* 19)

Indian Standard

SPECIFICATION FOR CASTOR OIL FOR COSMETIC INDUSTRY

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 11 December 1985, after the draft finalized by the Cosmetics Sectional Committee had been approved by the Petroleum, Coal and Related Products Division Council.

0.2 IS : 435-1973* covers a number of grades used in a variety of industries. The present standard has been drawn up specifically to cater to the needs of the cosmetic industry.

0.3 All other changes considered necessary to align the standard with others in the series for raw materials and finished cosmetics have been included.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes requirements and methods of sampling and test for castor oil for cosmetic industry.

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions given under 2 of IS : 548 (Part 1)-1964‡ shall apply.

---

*Specification for castor oil (*second revision*).

†Rules for rounding off numerical values (*revised*).

‡Methods of sampling and test for oils and fats: Part 1 Sampling, physical and chemical tests (*revised*).

3. REQUIREMENTS

3.1 Description — The material shall be castor oil obtained from castor seeds (*Ricinus communis* Linn., fam. Euphorbiaceae) by a process of cold expression. The oil shall have further undergone bleaching with bleaching earth or activated carbon or both and deodorisation with steam. The oil shall be practically odourless or have a very mild odour characteristics of castor oil. The material shall be free from sediment, suspended and other foreign matter and separated water.

3.2 Clarity — The material shall pass the clarity test as given in Appendix A. The material, when tested as prescribed in Appendix A, shall have a turbidity value (in terms of silica units) not more than 10.

3.3 Admixture with other Oils — The material shall be free from admixture with other oils, when tested according to the methods prescribed in IS : 548 (Part 2)-1976*.

3.4 The material shall also comply with the requirements given in Table 1.

TABLE 1 REQUIREMENTS FOR CASTOR OIL FOR COSMETIC INDUSTRY

(*Clauses* 3.4 *and* 7.1)

SL No.	CHARACTERISTIC	REQUIREMENTS	METHOD OF TEST REF TO	
			Appendix	Cl No. of IS : 548 (Part 1)-1964*
(1)	(2)	(3)	(4)	(5)
i)	Colour in a 1″ cell on the Lovibond Scale, in terms of (Y + 5R) Units, *Max*	4·0	—	13
ii)	Relative density at 30°/30°C	0·954 to 0·960	—	11
ii)	Refractive index at 40°C	1·470 0 to 1·474 0	—	10
v)	Critical solution temperature, *Max*	0°C	B	—
v)	Acid value, *Max*	2·0	—	7
vi)	Saponification value	177 to 185	—	15
vii)	Unsaponifiable matter, percent by mass, *Max*	0·8	—	8
viii)	Acetyl value, *Min*	143·0	—	16
ix)	Iodine value (Wij's)	82 to 90	—	14
x)	Moisture and volatile, percent by mass, *Max*	0·25	—	5.1 and 5.2
xi)	Test for rancidity	Shall be free from rancidity	C	—
xii)	Test for detection of cold pressed/hot pressed oil	Shall be cold pressed only	[illegible]	—

*Methods of sampling and test for oils and fats : Part 1 Sampling, physical and chemical tests (*revised*).

---

*Methods of sampling and test for oils and fats : Part 2 Purity tests (*third revision*).

4. PACKING

4.1 The material shall be packed in suitable well closed containers which do not deteriorate the product, in quantities as agreed to between the purchaser and the supplier.

5. MARKING

5.1 The containers shall be marked with the following:

a) Name of the material;

b) Manufacturer's name and/or his recognized trade-mark, if any;

c) Net mass of the material in the container;

d) Month and year of manufacture; and

e) Code number to enable the lot of manufacture to be traced back from records.

5.1.1 The product may also be marked with Standard mark.

5.2 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

6. SAMPLING AND CRITERIA FOR CONFORMITY

6.1 For the purpose of ascertaining the conformity of the material in a consignment to this specification, the procedure for drawing the samples, the scale of sampling and the criteria for conformity shall be as prescribed in **3** of IS : 548 (Part 1)-1964*.

7. TEST METHODS

7.1 Tests shall be carried out as prescribed in appendices to this standard and the methods prescribed in IS : 548 (Part 1)-1964*. References to the appendices to this standard and the relevant clauses of IS : 548 (Part 1)-1964* are given in col 4 and 5 of Table 1 respectively.

---

*Methods of sampling and test for oils and fats: Part 1 Sampling, physical and chemical tests (*revised*).

7.2 Quality of Reagents — Unless specified otherwise, pure chemicals and distilled water (*see* IS : 1070-1977*) shall be used in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

APPENDIX A

(*Clause* 3.2.2)

DETERMINATION OF TURBIDITY OF SILICA SCALE

A-1. TERMINOLOGY

A-1.1 For the purpose of this test, the following definition shall apply.

A-1.1.1 *Silica Scale Unit* — Turbidity imparted by 1 mg of fullers' earth when suspended in 1 000 ml of distilled water.

A-2. PREPARATION OF TURBIDITY STANDARDS

A-2.1 Mix slowly with constant stirring 5·000 g of fullers' earth, previously dried and sieved through 75 µm IS Sieve [*see* IS : 460 (Part 1)-1978†] with distilled water and dilute it to 1 000 ml. Agitate intermittently for one hour and then allow to stand for 24 hours. Withdraw the supernatant liquid without disturbing the sediment. Evaporate about 50 ml of the removed liquid, dry the residue at 105 ± 2°C and weigh the residue to determine the amount of clay in suspension. Prepare turbidity standards with the standardized stock suspension with distilled water. A drop of saturated mercuric chloride solution may be added as preservative. The standards are stable for 3 months.

A-3. PROCEDURE

A-3.1 Pour the sample after thorough shaking into a clear glass bottle of suitable capacity, say, one litre. Compare it with the turbidity standards contained in similar bottles, holding then against a suitable background and using a source of light which illuminates them equally and is to be placed in a position that no rays reach the eye directly. The sample and the standards shall be shaken simultaneously immediately before comparison.

---

*Specification for water, for general laboratory use (*second revision*).

†Specification for test sieves : Part 1 Wire cloth test sieves (*second revision*).

A-3.1.1 *Report* — Record the turbidity readings in the range 1 to 10 to the nearest unit and in the range 11 to 100 to the nearest 5 units.

APPENDIX B

[*Table* 1, *Item* (iv)]

DETERMINATION OF CRITICAL SOLUTION TEMPERATURE

B-1. REAGENTS

B-1.1 The reagents shall be prepared by diluting ethyl alcohol (conforming to IS : 321-1964*) or rectified spirit (conforming to IS : 323-1959†) with distilled water till the relative density of the mixture at 15·5°C is 0·830 3 ± 0·000 1, when compared with distilled water at the same temperature. Denatured alcohol shall not be used for this test.

B-2. PROCEDURE

B-2.1 Mix in a test tube 1·0 g of the material with 4·15 times its mass of the reagent. On examination, the solution thus obtained shall be perfectly clear at 20°C and shall remain clear when cooled and maintained for 5 min at a temperature of 0°C.

APPENDIX C

[*Table* 1, *Item* (ix)]

C-1. TEST FOR RANCIDITY

C-1.1 Reagents

C-1.1.1 *Phloroglucinol Solution* — Dissolve 0·1 g of phloroglucinol in 100 ml diethyl ether.

C-1.2 Procedure — Shake 10 ml of the material, melt it if necessary, with 10 ml of concentrated hydrochloric acid and 10 ml of phloroglucinol solution. Shake for 1 minute.

C-1.2.1 The material shall be taken to have passed the test if no pink colour develops.

---

*Specification for absolute alcohol (*revised*).

†Specification for rectified spirit (*revised*).

APPENDIX D

[*Table* 1, *Item* (xii)]

METHOD FOR THE DETECTION OF THE PROCESSING (COLD PRESSED OR HOT PRESSED) OF CASTOR OIL

D-1. GENERAL

D-1.1 The method involves the isolation of toxic components (Ricinine, etc) from the castor oil by its treatment with acetone solution followed by its extraction with chloroform. The chloroform extract is cleaned up, concentrated and spotted on TLC plates. The plates are developed at chamber saturation and excited under fluorescent light for visualization of the alkaloid(s). The hot pressed castor oil yields typical fluorescent spots in ultra violet light (365 nm).

D-1.1 Apparatus

D-1.1.1 *U.V. Lamp for Fluorescence Excitation in the Long Wave Region* (Chromato-Vue may be used with special advantage).

D-1.1.2 *Mechanical Shaker/Magnetic Stirrer*

D-1.1.3 *TLC Plates* — (20 × 10 cm) and a suitable developing chamber.

D-1.1.4 *A Suitable Spreading Device for Adjusting Layer Thickness*

D-1.1.5 *Conical Flask* — 300 to 500 ml.

D-1.1.6 *Porcelain Dishes* — 50-ml.

D-1.1.7 *Separating Funnel* — 500-ml.

D-1.1.8 *Electric Oven with Temperature Control Device*

D-1.1.9 *Desiccator Containing an Efficient Dryer*

D-1.1.10 *Graduated Micro-Pipettes/Micro Syringes*

D-1.2 Reagents

D-1.2.1 *Kiselegal 'G' or Equivalent Grade Silica Gel Containing Suitable Amount of Calcium Sulphate as Binder*

D-1.2.2 *Whatman Filter Paper No. 42 (or Equivalent)*

D-1.2.3 *Anhydrous Sodium Sulphate*

D-1.2.4 *Acetone*

D-1.2.5 *Acetone* : *Water* — (1 : 1 *v*/*v*).

D-1.2.6 *Chloroform*

D-1.2.7 *Methanol*

D-1.2.8 *Solvent System* — Chloroform : Methanol (85 : 15) (*v*/*v*).

D-1.3 Preparation of TLC Plates — The plates are coated with silica gel 'G' by a suitable spreading device, adjusting the layer-thickness at 300 nm, allowed to set and activated at 115 ± 1°C for an hour. The plates are stored in desiccator.

D-1.4 Procedure — Take 10 ml of sample in a conical flask and add 50 ml acetone solution (**D-1.2.5**). Heat the mixture on a boiling water bath till simmering starts. Shake/stir the mixture using a mechanical shaker magnetic stirrer for 15 minutes. Let the mixture attain the room temperature and the oily layer float on the surface. Filter through a water-soaked filter paper (No. 42). Discontinue the filteration after the acetone extract stops trickling. Transfer the filterate into a separating funnel and extract 5 times with 3 ml of purified chloroform shaking the mixture well, each time. Break the emulsion (if formed) by dropping a few crystals of anydrous sodium sulphate. Clean up both the portions of this extract by passing it slowly through a column, containing suitable amount of anhydrous sodium sulphate. Receive the eluate in a porcelain dish. Evaporate the solvent on a boiling water bath and redissolve the residue in 0·2 ml dry chloroform. Spot 0·05 ml on a silica gel coated plate (**D-1.3**). Develop the plate at chamber saturation, using the above solvent system (**D-1.2.8**) till the solvent front reaches the height of 10 cm. Dry the plate by hair dryer and place it in an oven (maintained at 60 to 80°C) for 5 to 10 minutes.

D-1.5 Visualisation of Fluorescent Spots — The plate is visualized under ultra violet light in the long wave region (365 mm). In case of hot pressed castor oil, two green fluorescent spots at Rf 0·5 and one deep blue spot at Rf 0·9 appear. A blue spot around Rf 0·7 may also appear sometimes. In case of cold pressed castor oil blue spots at Rf 0·9 and 0·7 may appear but the specific green spots shall be absent.

D-1.6 Sensitivity — The method is highly sensitive in detecting the type of processing of castor oil. The genuine cold drawn (medicinal grade) castor oil can only pass the test. Hot pressed castor oil even after refining and bleaching fails to pass the test. The method is also capable of detecting the admixture of as low as 5 to 10 percent, hot pressed castor oil with cold pressed castor oil.

NOTE 1 — Development at chamber saturation is recommended in order to achieve sharpness in resolution and improve the reproducibility of Rf values.

NOTE 2 — Solvent mixture shall be prepared with care and as far as possible prepared freshly before each use.

(*Continued from page* 2)

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AMENDMENT NO. 1 DECEMBER 1995
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IS 11486 : 1985 SPECIFICATION FOR CASTOR OIL FOR COSMETIC INDUSTRY

(*Page* 4, *clause* 3.2) — Insert the following at the end of the clause:

' The test for rancidity shall be performed if it is agreed to between the purchaser and the supplier.'

(*Page* 4, *Table* 1) — Add the following at the end of the Table:

(1)	(2)	(3)	(4)
xiii)	Peroxide value, *Max*	5.0	E

(*Page* 9, *Appendix* D) — Add the following new Appendix at the end:

'APPENDIX E

DETERMINATION OF PEROXIDE VALUE

[*Table* 1, *Sl No.* (xiii)]

E-1 REAGENTS

E-1.1 Glacial Acetic Acid (*see* IS 695 : 1986)

E-1.2 Chloroform (*see* IS 5296 : 1979)

E-1.3 Saturated Potassium Iodide Solution

E-1.4 Sodium Thiosulphate — 0.01 N.

E-1.5 Starch Solution

E-2 PROCEDURE

Weigh 5.0 ± 0.5 g of the sample in a 250-ml glass-stoppered conical flask. Add 30 ml of a mixture of 3 volumes glacial acetic acid and 2 volumes of chloroform. Swirl until dissolved, and add 0.5-ml of saturated potassium iodide solution. Allow to stand for exactly one minute, with occasional shaking, add 30 ml of water. Titrate gradually, with continuous and vigorous shaking, with 0.01 N sodium thiosulphate solution until the yellow colour almost disappears. Add 0.5 ml of starch solution, continue the titration, shaking vigorously until the blue colour just disappears (A). Carry out a blank determination under the same condition without adding any sample (B). The volume of 0.01 N sodium thiosulphate in the blank determination must not exceed 0.1 ml.

E-3 CALCULATION

Calculate the peroxide value from the expression:

$$\text{Peroxide value} = \frac{(A - B) \times 10}{M}$$

where

A = volume in ml of 0.01 N sodium thiosulphate required for titration,

B = volume in ml of 0.01 N sodium thiosulphate required for blank titration, and

M = mass in g of the sample.'

(PCD 19)

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AMENDMENT NO. 2 JULY 2004
TO
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[*Page* 4, *Table* 1, *Sl No.* (xiii) (*see also Amendment No.*1)] — Substitute the following for the existing:

(1)	(2)	(3)	(4)	(5)
xiii)	Peroxide value, meq/kg, *Max*	10	E	-

(PCD 19)

Reprography Unit, BIS, New Delhi, India